

Vilfredo Pareto

(1848 - 1923)



"In any series of elements to be controlled, a selected small fraction, in terms of numbers of elements, always accounts for a large fraction in terms of effect."

Vilfredo Pareto, noted economist and sociologist, is best known for his law of income distribution, which is often called Pareto's Law or the 80/20 Rule. This law is a mathematical formulation in which he attempts to prove that the distribution of incomes and wealth in society is not random, but exhibits a consistent pattern. This relationship follows a regular logarithmic pattern and can be charted in a similar shape, regardless of the time period or country studied.

The formula is:

$$\log N = \log A + m \log x$$

where N is the number of income earners who receive incomes higher than x , and A and m are constants. In simplified terms, 80% of the wealth is owned by 20% of the population.

Relating Pareto's Law to machinery protection

The 80/20 Rule has also been found to apply in many other fields, including machinery protection and management. For example, in a large percentage of plants, most of the machinery problems and associated economic costs are caused by a relatively small population of machines. Although this split is not always an exact 80/20 division, Pareto's general principle still applies. Most machinery problems in a plant are caused by a small percentage of machines.

Today, "Pareto analysis" is a commonly-used method of separating the major causes (the "vital few") of a problem, from the minor ones (the "trivial many"). It helps prioritize and focus resources where they are most needed by showing where initial effort should be placed to produce the most gain. It also helps measure the impact of an improvement by comparing before and after conditions.

Pareto diagrams or charts effectively display the relative importance of causes, problems, or other conditions. In the machinery management and protection example, analysis of which machines are causing the bulk of the problems can be used to justify new management and protection efforts and to demonstrate the financial impact consequently realized from such efforts.

Pareto studied Civil Engineering at

the University of Turin, Italy. The first two years at the university were devoted to mathematics, which deeply influenced his future intellectual outlook. From 1870 to 1893, he worked as an engineer, studied philosophy and politics, and also wrote many articles. He was one of the first people to analyze economic problems using mathematics. Vilfredo Pareto died in 1923. That his ideas continue to be discussed and debated suggests their impact and timelessness. ☺

References

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4. Richard Koch, *The 80/20 Principle: The Secret of Achieving More with Less*, 1998.